



HWY 567/Pipe Creek Road
Libby North Corridor Planning Study

Roadway Inventory

October 2007

**Draft
Volume II**



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EXISTING PAVEMENT CROSS-SECTION	XS-01

THIS DESIGN CRITERIA WAS USED IN DEVELOPING THIS ROADWAY INVENTORY.
SUBSTANDARD ROADWAY ELEMENTS ARE COMPARED TO THIS TABLE.

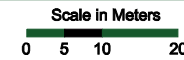
LIBBY NORTH CORRIDOR STUDY

HWY 567 / PIPE CREEK ROAD

EXISTING GEOMETRICS EVALUATION CRITERIA				
Design Element			Manual Section	Design Criteria
Design Controls	Design Forecast Year		8.4	2030
	Design Speed	Mountainous	8.3	45 mph (70km/h)
	Level of Service		8.4	B
Roadway Elements	Design Year Traffic	Current AADT	N/A	350
		DHV		44
	Roadway Width (Travel Lanes & Shoulders)		11.2	28 ft (8.4 m)
	Cross Slope	Travel Lane	11.2	2%
		Shoulder		2%
	Median Width		11.3	N/A
Earth Cut Section	Inslope		11.4	4:1 (6.0 ft - 2.0 m)
	Ditch	Width	11.4	10 ft (3.0 m)
		Slope		20:1
	Back Slope; Cut Depth at Slope Stake	0'-5' (0-1.5m)	11.4	5:1
		5' - 10' (1.5m - 3.0m)		3:1
		10' - 15' (3.0m - 4.5m)		2:1
		12' - 20' (4.5m - 6.0m)		1.5:1
		> 20' (6.0m)		1.5:1
Earth Fill Slopes	Fill Height at Slope Stake	0'-10' (0-3.0)	11.4	4:1
		10' - 20' (3.0m - 6.0m)		3:1
		20' - 30' (6.0m - 9.0m)		3:1
		> 30'(9.0m)		2:1
Alignment Elements	DESIGN SPEED		N/A	45 mph (70km/h)
	Stopping Sight Distance		8.6	360 ft (105m)
	Passing Sight Distance		8.6	1625 ft (490m)
	Minimum Radius (e=8.0%)		9.2	590 ft (175m)
	Superelevation Rate		9.3	emax = 8.0%
	Vertical Curvature (k-value)	Crest	10.5	61 (17 metric)
		Sag		79 (23 metric)
	Maximum Grade	Mountainous	10.3	10%
	Minimum Vertical Clearance		10.6	16.5 ft (5.05m)

(1) All Information listed here was taken from Figure 12-5 "Geometric Design Criteria for Rural Collector Roads" Montana Department of Transportation Road Design Manual Chapter 12 except where otherwise noted.

7/31/2007 \$FILE\$



LEGEND

Edge of Pavement

Major Contours

Minor Contours

Creek or Ditch

Existing Guard Rail

Power Pole

MB Mall Box

Existing Right of Way

Property Line

Section Line

1/ 4 Section Line

Property Corner Found

Fire Hydrant

High Water Mark

Snow Storage Problem Area

Well

CROSS CULVERT

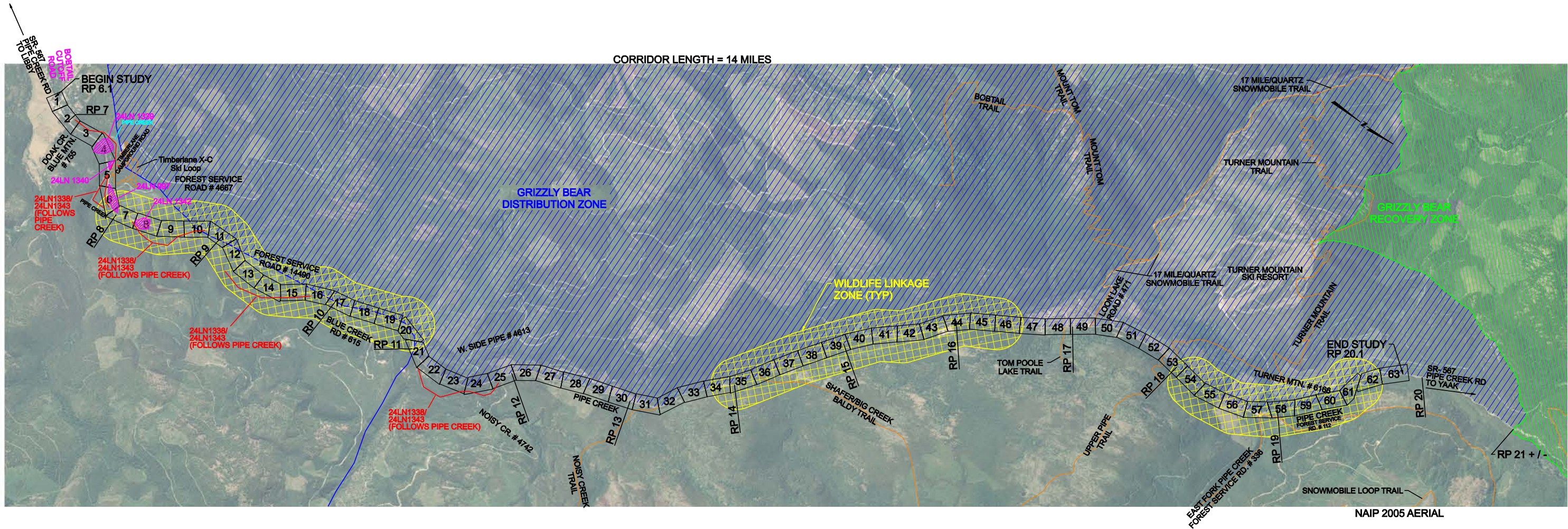
W / FLOW DIRECTION



NOTES:

1. a. CULTURAL RESOURCE INFORMATION TAKEN FROM "CULTURAL RESOURCE INVENTORY AND EVALUATION VOLUME 1: REPORT 11Km NORTH OF LIBBY NORTH HIGHWAY RECONSTRUCTION PROJECT LINCOLN COUNTY, MONTANA", JANUARY 2004.
- b. ONLY THOSE SITES LISTED AS ELIGIBLE FOR THE NATIONAL REGISTER OF HISTORIC PLACES ARE SHOWN.
2. WILDLIFE LINKAGE ZONES TAKEN FROM THE STUDY "11 KM NORTH OF LIBBY - NORTH CORRIDOR STUDY: PRELIMINARY WILDLIFE HABITAT LINKAGE ANALYSIS."
3. GRIZZLY BEAR RECOVERY AND DISTRIBUTION ZONES TAKEN FROM US FISH AND WILDLIFE SERVICE DATA.
4. TRAIL INFORMATION TAKEN FROM US FOREST SERVICE MAPS, AERIAL PHOTOS, AND FIELD OBSERVATIONS.

SITES	DESCRIPTION
24LN1338 / 24LN1343	PIPE CREEK MAINLINE LOGGING RAILROAD
24LN1339	SPRING BOARD STUMPS
24LN1340	SPRING BOARD STUMPS
24LN1342	SPRING BOARD STUMPS
24LN997	SPRING BOARD STUMPS



7/31/2007 #P1LE3

Keymap

LEGEND					
Edge of Pavement	Creek or Ditch	Mail Box	Section Line	Fire Hydrant	Well
Major Contours	Existing Guard Rail	Existing Right of Way	1/4 Section Line	High Water Mark	CROSS CULVERT
Minor Contours	Power Pole	Property Line	Property Corner Found	Snow Storage Problem Area	W / FLOW DIRECTION

Environmental Information

Prepared By: D. Naillon
Reviewed By: R. Clegg

CORRIDOR LENGTH = 14 MILES



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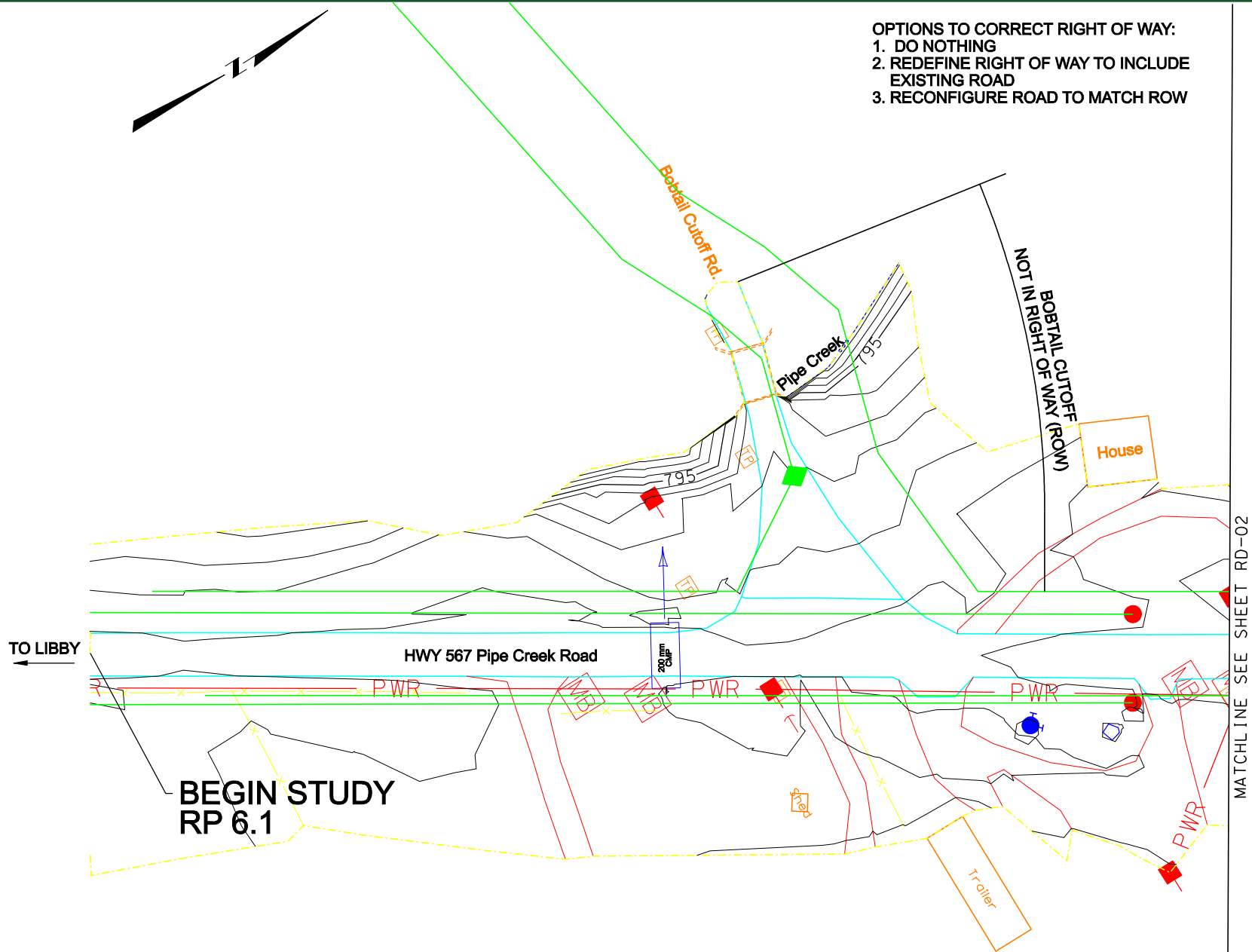
Keymap

LEGEND							
Edge of Pavement	Creek or Ditch	Mail Box	Section Line	Fire Hydrant	Well		
Major Contours	Existing Guard Rail	Existing Right of Way	1/4 Section Line	High Water Mark	CROSS CULVERT		
Minor Contours	Power Pole	Property Line	Property Corner Found	Snow Storage Problem Area	W / FLOW DIRECTION		

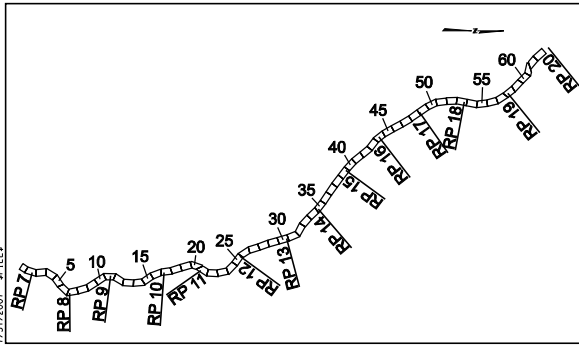
Sheet: RD-00

Roadway Inventory Index

Prepared By: D. Naillon
Reviewed By: R. Clegg

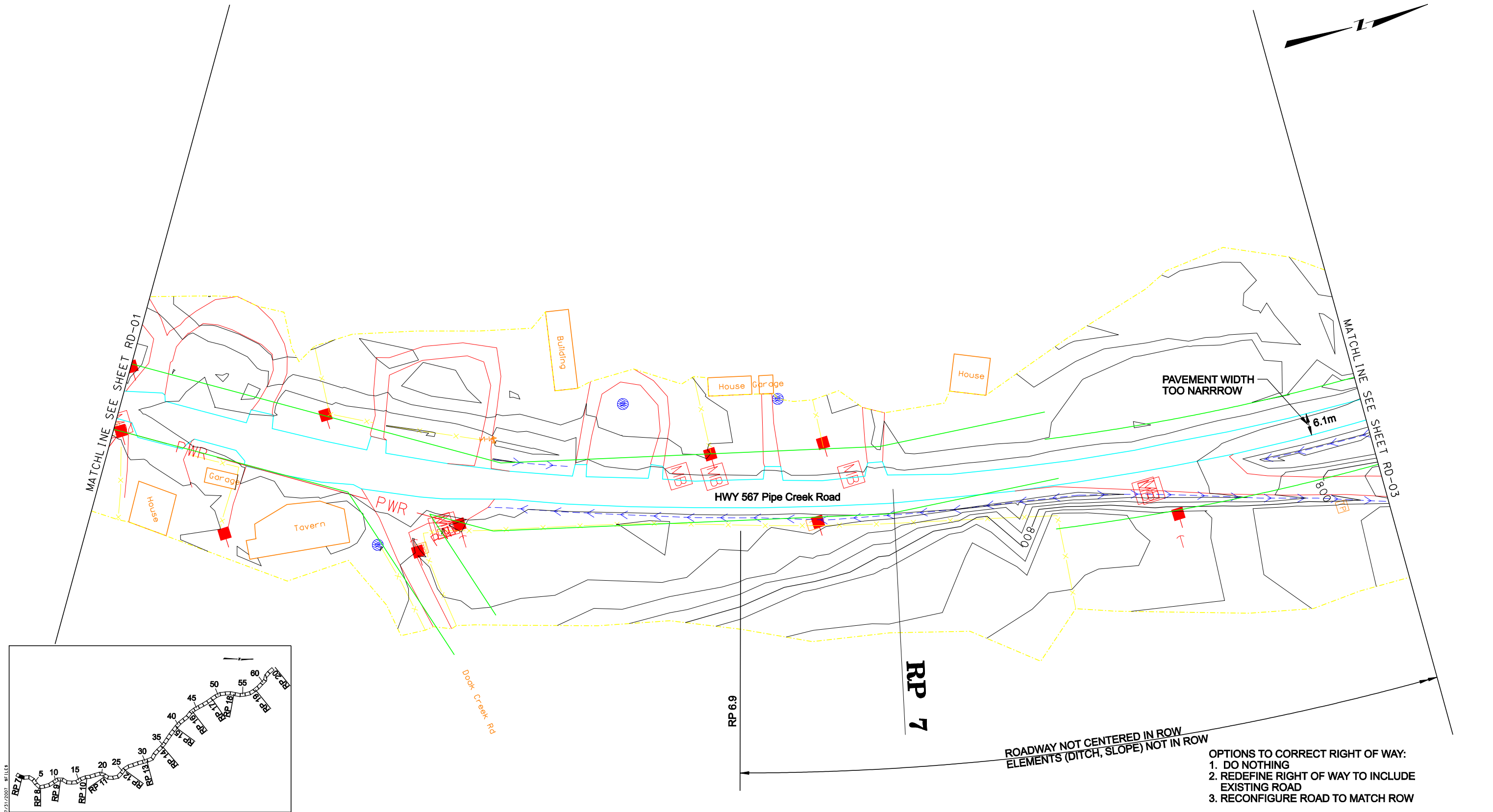


- OPTIONS TO CORRECT RIGHT OF WAY:
1. DO NOTHING
 2. REDEFINE RIGHT OF WAY TO INCLUDE EXISTING ROAD
 3. RECONFIGURE ROAD TO MATCH ROW



Scale in Meters
0 5 10 20

LEGEND									
Edge of Pavement	Creek or Ditch	Mail Box	Section Line	Fire Hydrant	Well				
Major Contours	Existing Guard Rail	Existing Right of Way	1/4 Section Line	High Water Mark	CROSS CULVERT				
Minor Contours	Power Pole	Property Line	Property Corner Found	Snow Storage Problem Area	W / FLOW DIRECTION				



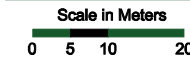
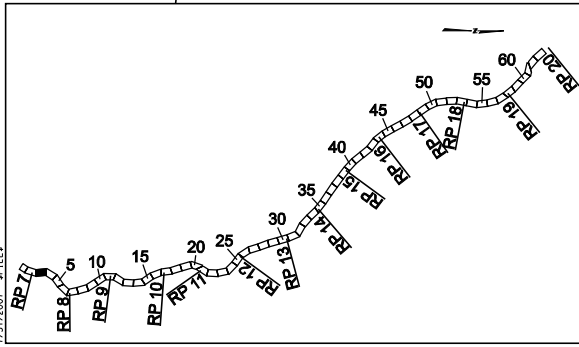
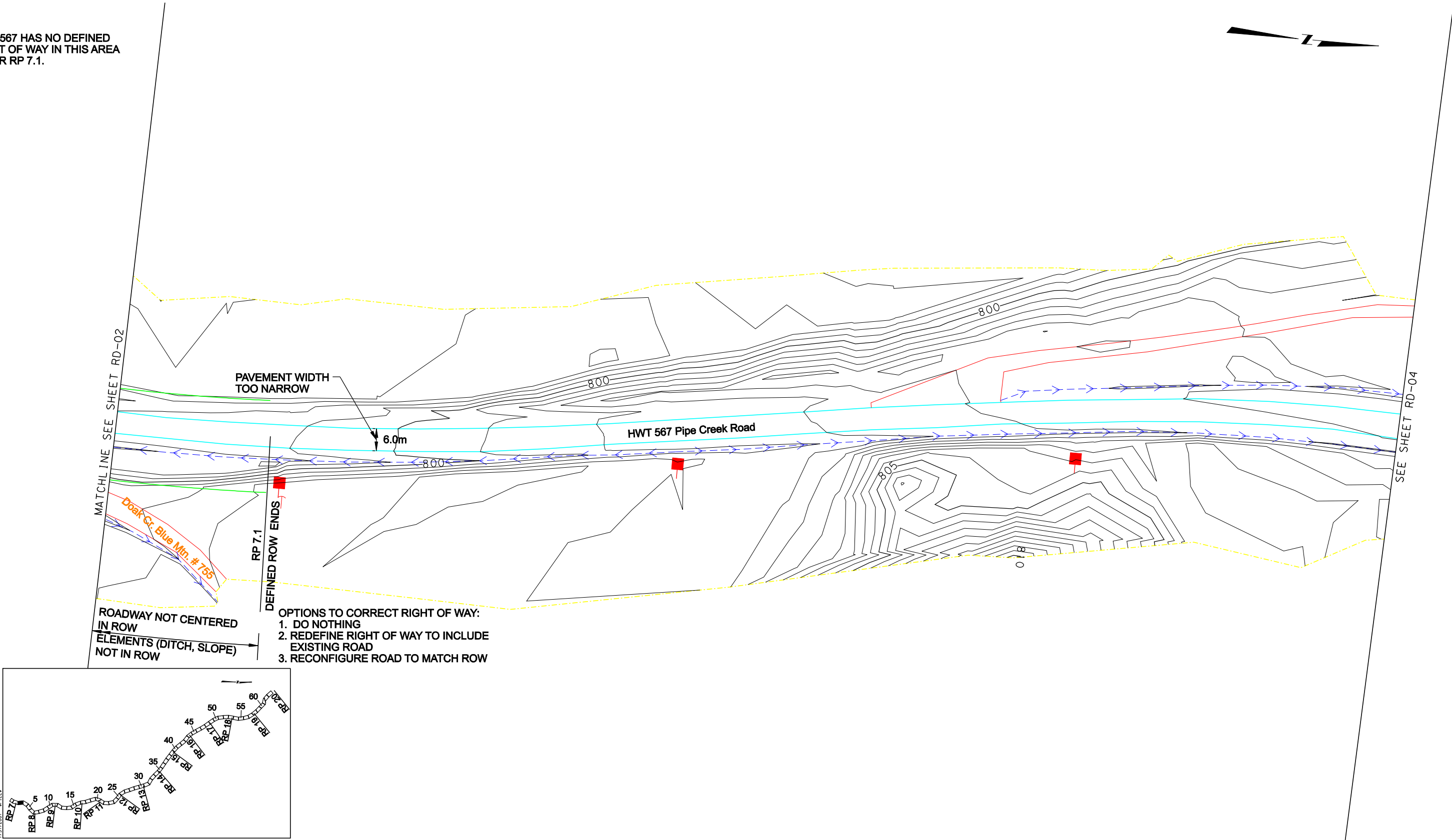
Scale in Meters
0 5 10 20

- LEGEND**
- Edge of Pavement
 - Major Contours
 - Minor Contours
 - Creek or Ditch
 - Existing Guard Rail
 - Power Pole
 - Mail Box (MB)
 - Existing Right of Way
 - Property Line
 - Section Line
 - 1/4 Section Line
 - Property Corner Found
 - Fire Hydrant
 - High Water Mark
 - Snow Storage Problem Area
 - Well
 - CROSS CULVERT W / FLOW DIRECTION

ROADWAY NOT CENTERED IN ROW
ELEMENTS (DITCH, SLOPE) NOT IN ROW

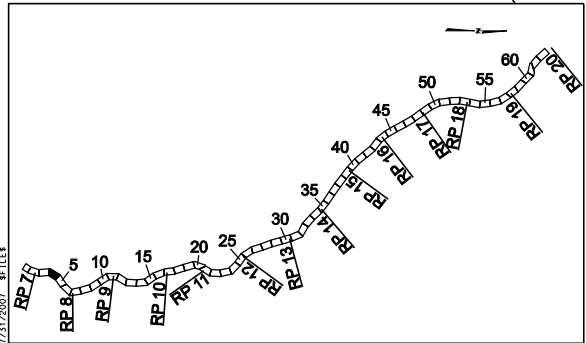
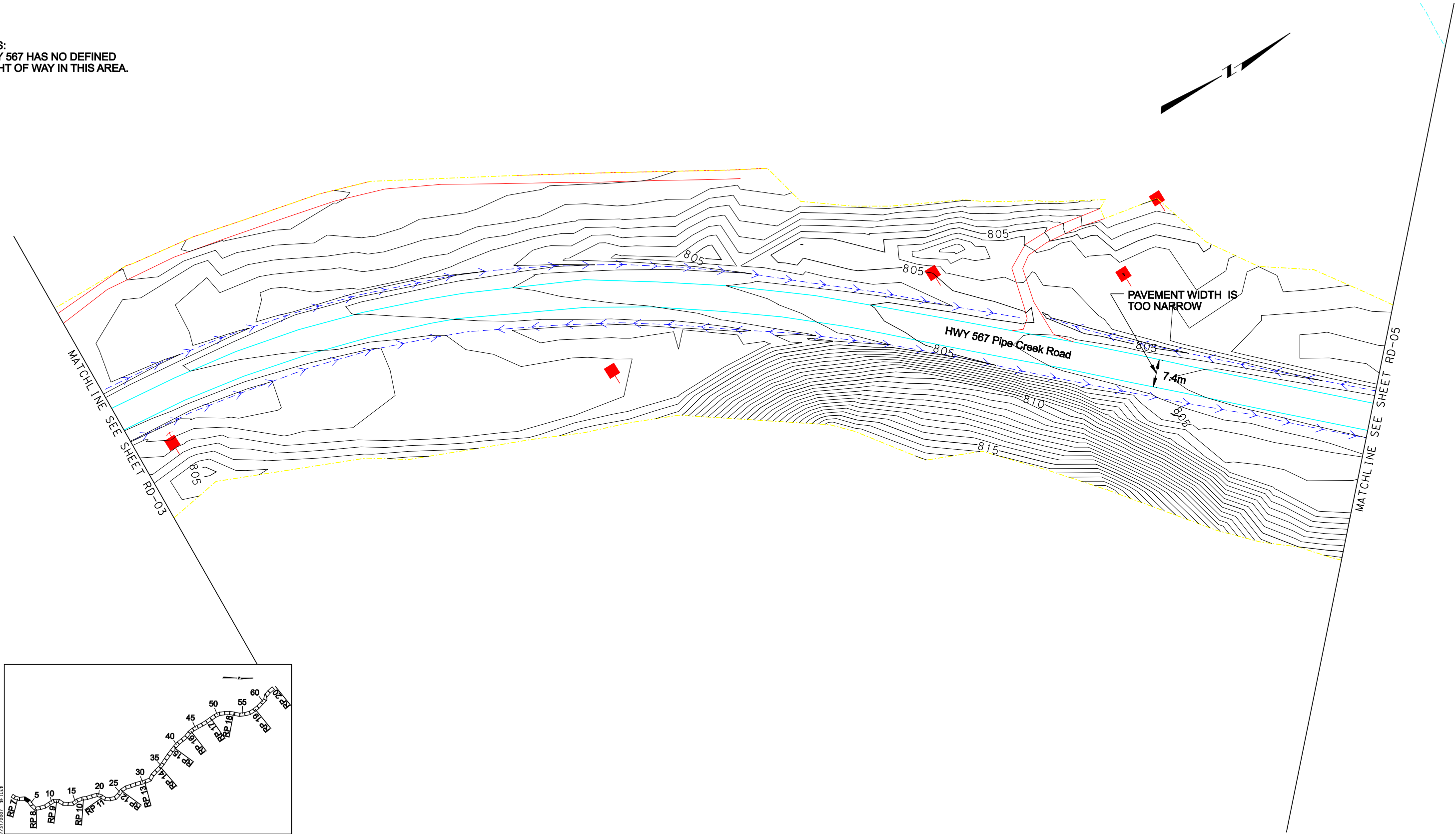
- OPTIONS TO CORRECT RIGHT OF WAY:
1. DO NOTHING
 2. REDEFINE RIGHT OF WAY TO INCLUDE EXISTING ROAD
 3. RECONFIGURE ROAD TO MATCH ROW

NOTES:
1. HWY 567 HAS NO DEFINED
RIGHT OF WAY IN THIS AREA
AFTER RP 7.1.

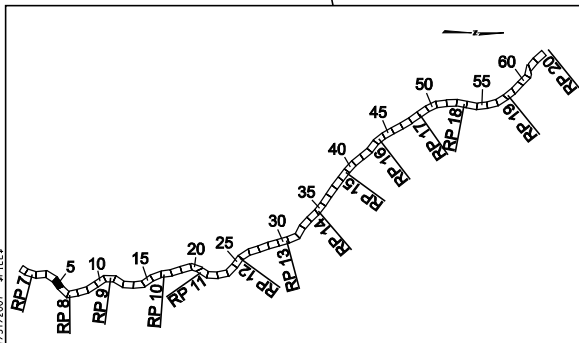
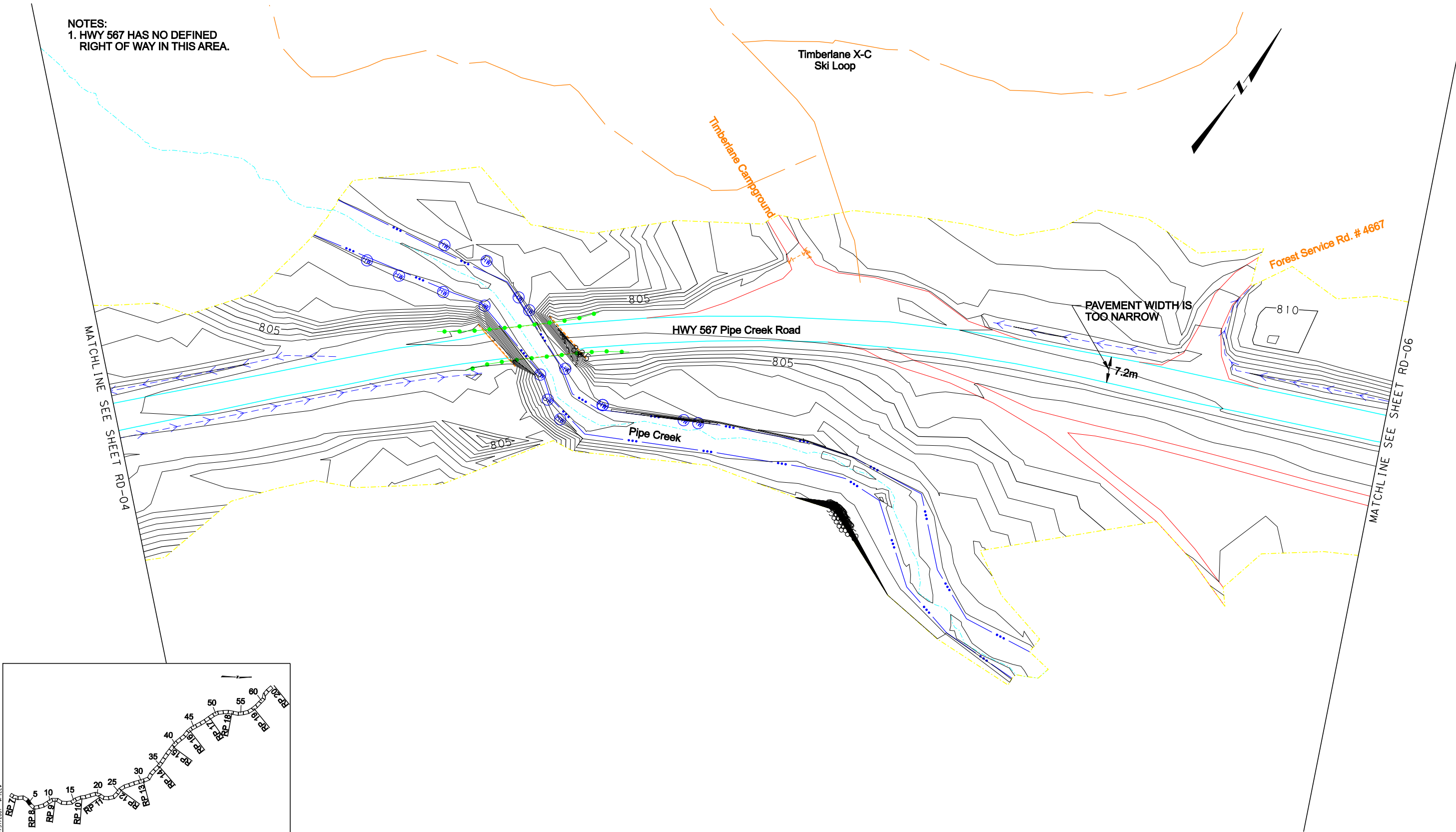


Edge of Pavement	Creek or Ditch	Mail Box	Section Line	Fire Hydrant	Well
Major Contours	Existing Guard Rail	Existing Right of Way	1/4 Section Line	High Water Mark	CROSS CULVERT
Minor Contours	Power Pole	Property Line	Property Corner Found	Snow Storage Problem Area	W / FLOW DIRECTION

NOTES:
1. HWY 567 HAS NO DEFINED
RIGHT OF WAY IN THIS AREA.



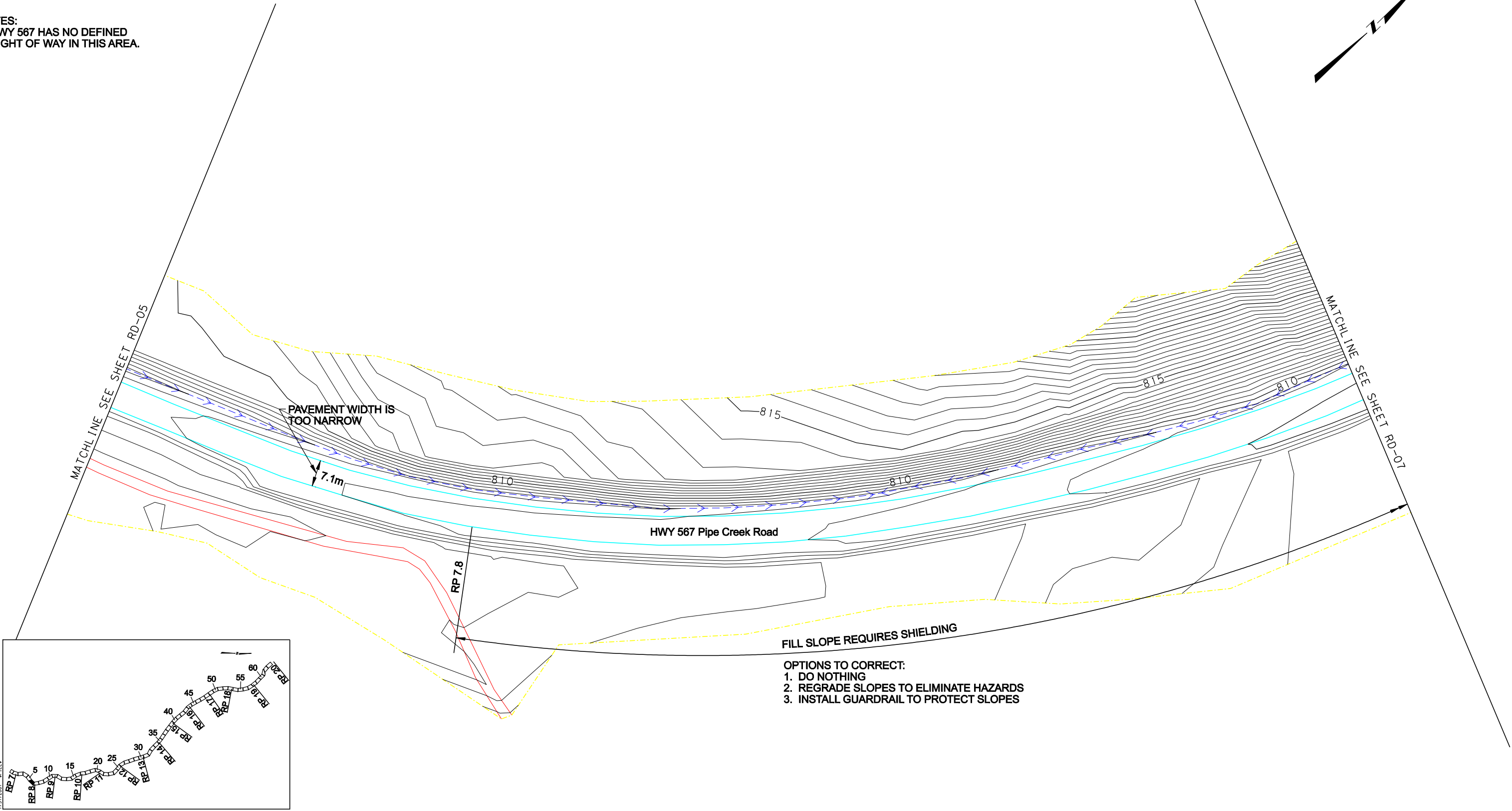
NOTES:
1. HWY 567 HAS NO DEFINED
RIGHT OF WAY IN THIS AREA.



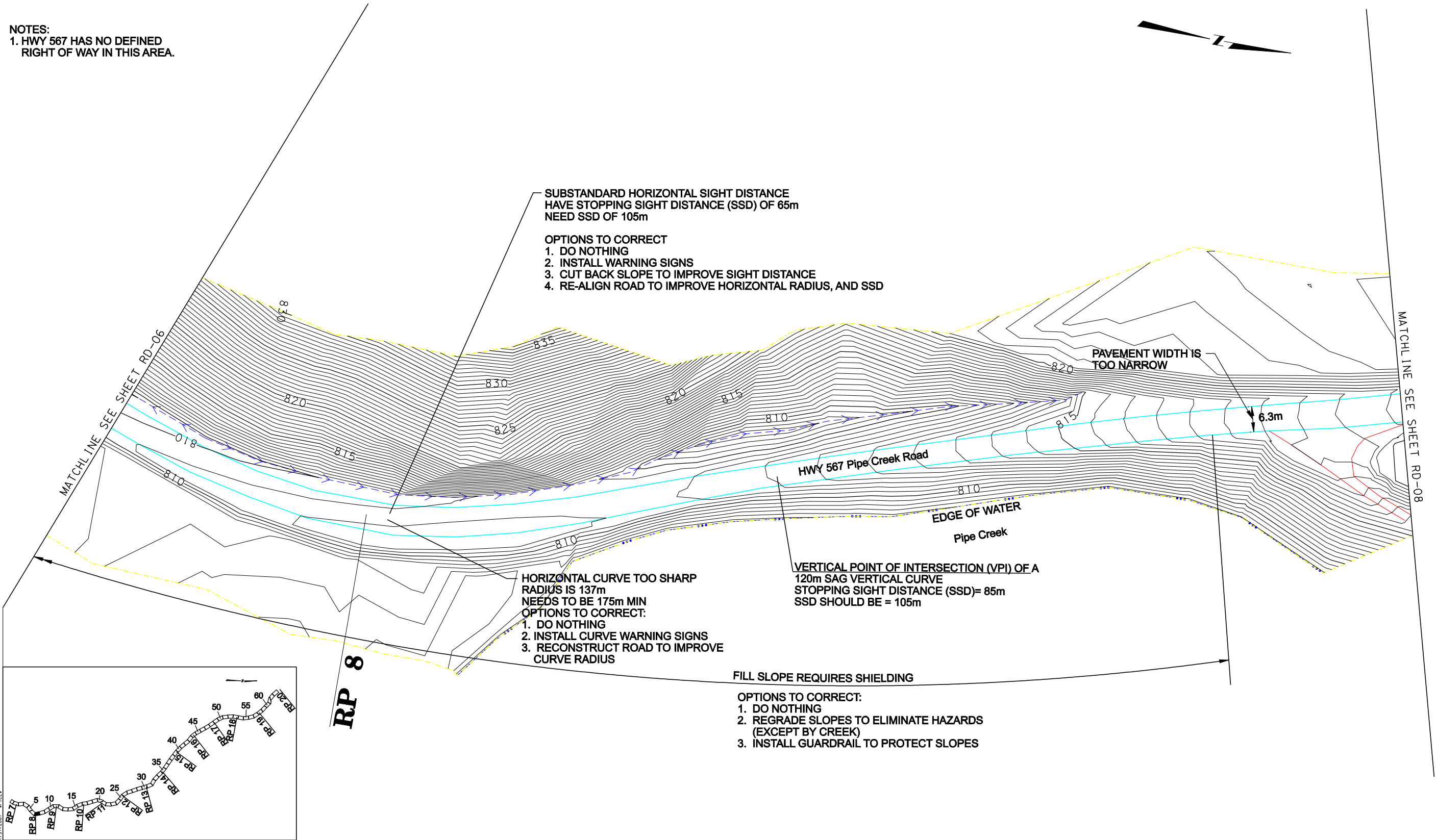
Scale in Meters
0 5 10 20

- | | | | | | |
|--------------------|-----------------------------------------------|-------------------------------------------------------------------------|------------------------------------------------------------|--------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| — Edge of Pavement | - - - - - Creek or Ditch | MB Mail Box | - - - - - Section Line | ● Fire Hydrant | W Well |
| — Major Contours | — Existing Guard Rail | — Existing Right of Way | - - - - - 1/4 Section Line | H High Water Mark | C CROSS CULVERT |
| — Minor Contours | ■ Power Pole | — Property Line | ● Property Corner Found | S Snow Storage Problem Area | → W / FLOW DIRECTION |

NOTES:
1. HWY 567 HAS NO DEFINED
RIGHT OF WAY IN THIS AREA.



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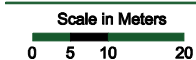
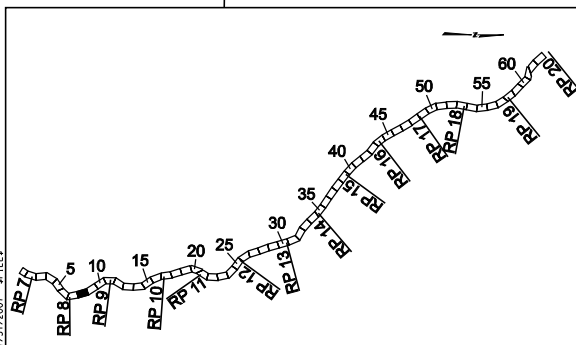
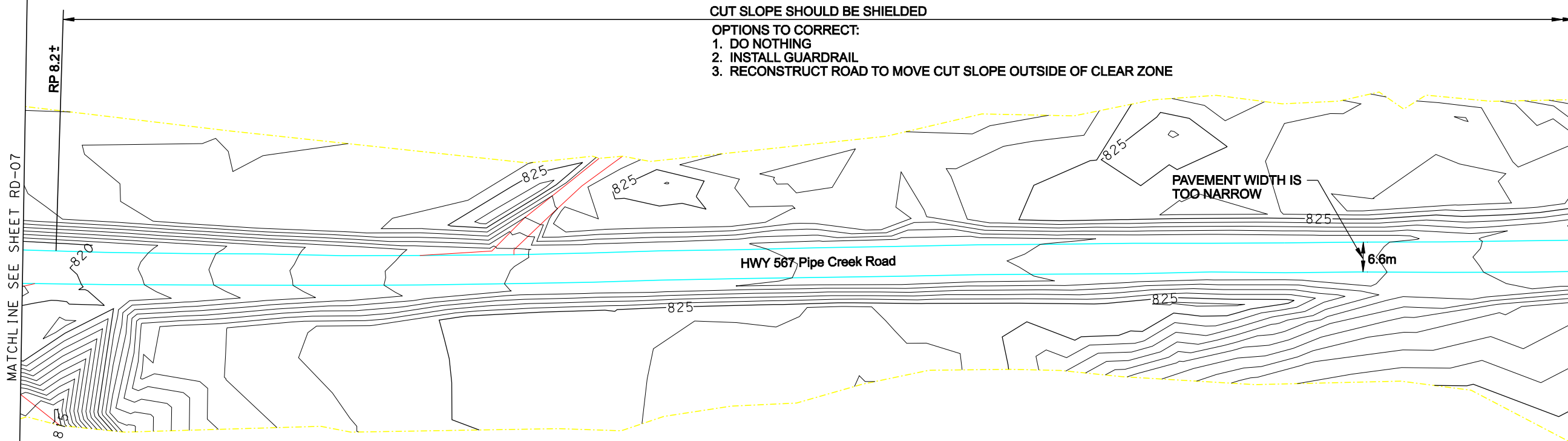


CUT SLOPE SHOULD BE SHIELDED
OPTIONS TO CORRECT:
1. DO NOTHING
2. INSTALL GUARDRAIL
3. RECONSTRUCT ROAD TO MOVE CUT SLOPE OUTSIDE OF CLEAR ZONE

MATCHLINE SEE SHEET RD-07

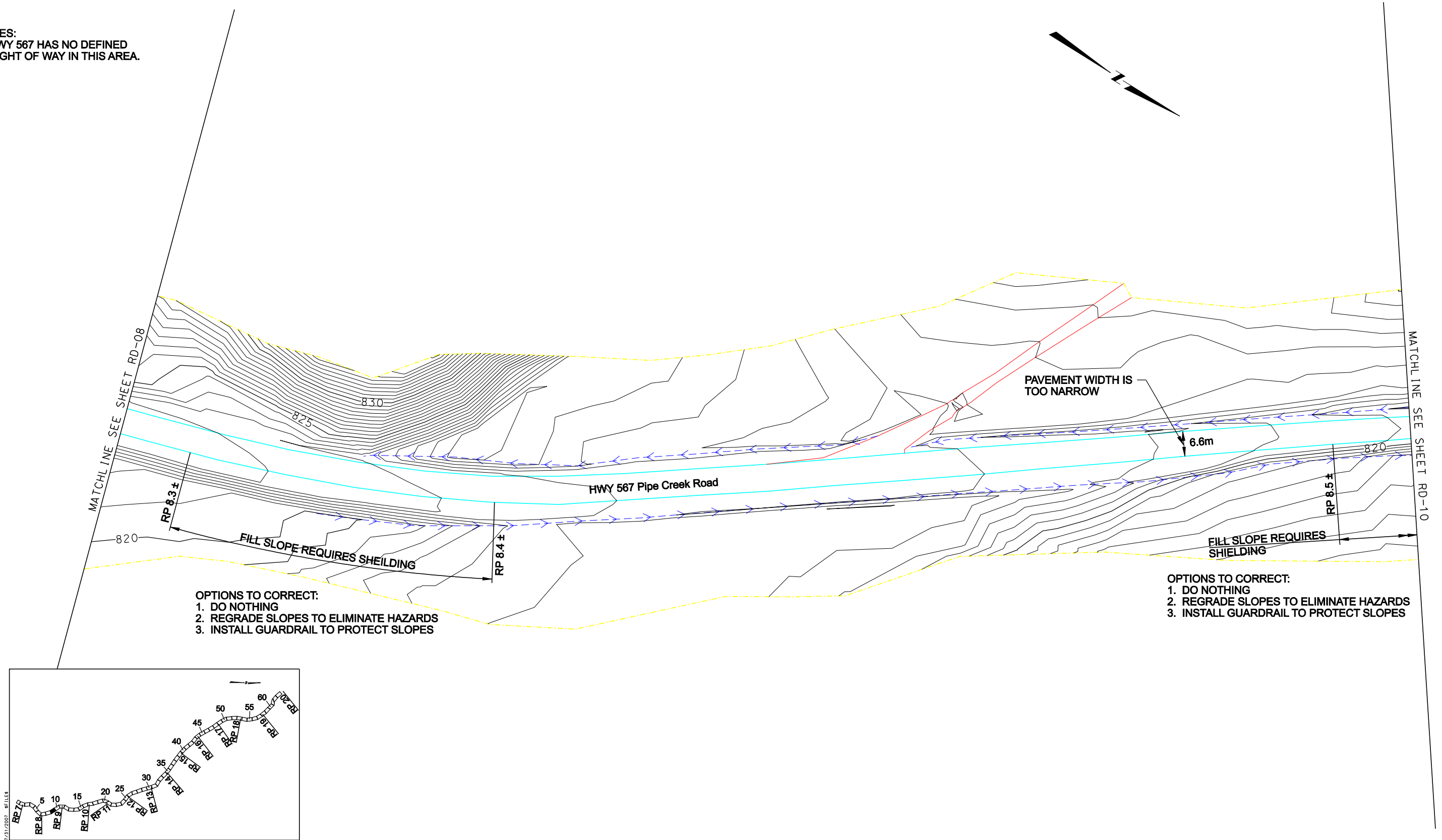
RP 82±

MATCHLINE SEE SHEET RD-09



- LEGEND
- | | | | | | |
|------------------|---------------------|-----------------------|-----------------------|---------------------------|--------------------|
| Edge of Pavement | Creek or Ditch | Mail Box | Section Line | Fire Hydrant | Well |
| Major Contours | Existing Guard Rail | Existing Right of Way | 1/4 Section Line | High Water Mark | CROSS CULVERT |
| Minor Contours | Power Pole | Property Line | Property Corner Found | Snow Storage Problem Area | W / FLOW DIRECTION |

NOTES:
1. HWY 567 HAS NO DEFINED
RIGHT OF WAY IN THIS AREA.



NOTES:
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RIGHT OF WAY IN THIS AREA.

OPTIONS TO CORRECT:
1. DO NOTHING
2. INSTALL GUARDRAIL
3. RECONSTRUCT ROAD TO MOVE CUT SLOPE OUTSIDE OF CLEAR ZONE

CUT SLOPE WITHIN CLEAR ZONE

OPTIONS TO CORRECT:
1. DO NOTHING
2. INSTALL GUARDRAIL
3. RECONSTRUCT ROAD TO
MOVE CUT SLOPE OUTSIDE
OF CLEAR ZONE

CUT SLOPE WITHIN
CLEAR ZONE

PAVEMENT WIDTH IS
TOO NARROW

HWY 567 Pipe Creek Road

6.0m

EDGE OF WATER

Pipe Creek

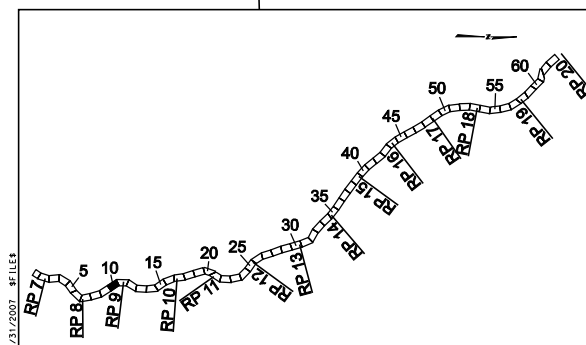
FILL SLOPE REQUIRES SHIELDING

OPTIONS TO CORRECT:
1. DO NOTHING
2. INSTALL GUARDRAIL TO PROTECT SLOPE

VPI OF A 30m CREST VERTICAL CURVE
SSD = 85m
SSD SHOULD BE = 105m

FILL SLOPE REQUIRES SHIELDING

OPTIONS TO CORRECT:
1. DO NOTHING
2. REGRADE SLOPES TO ELIMINATE HAZARDS
3. INSTALL GUARDRAIL TO PROTECT SLOPES

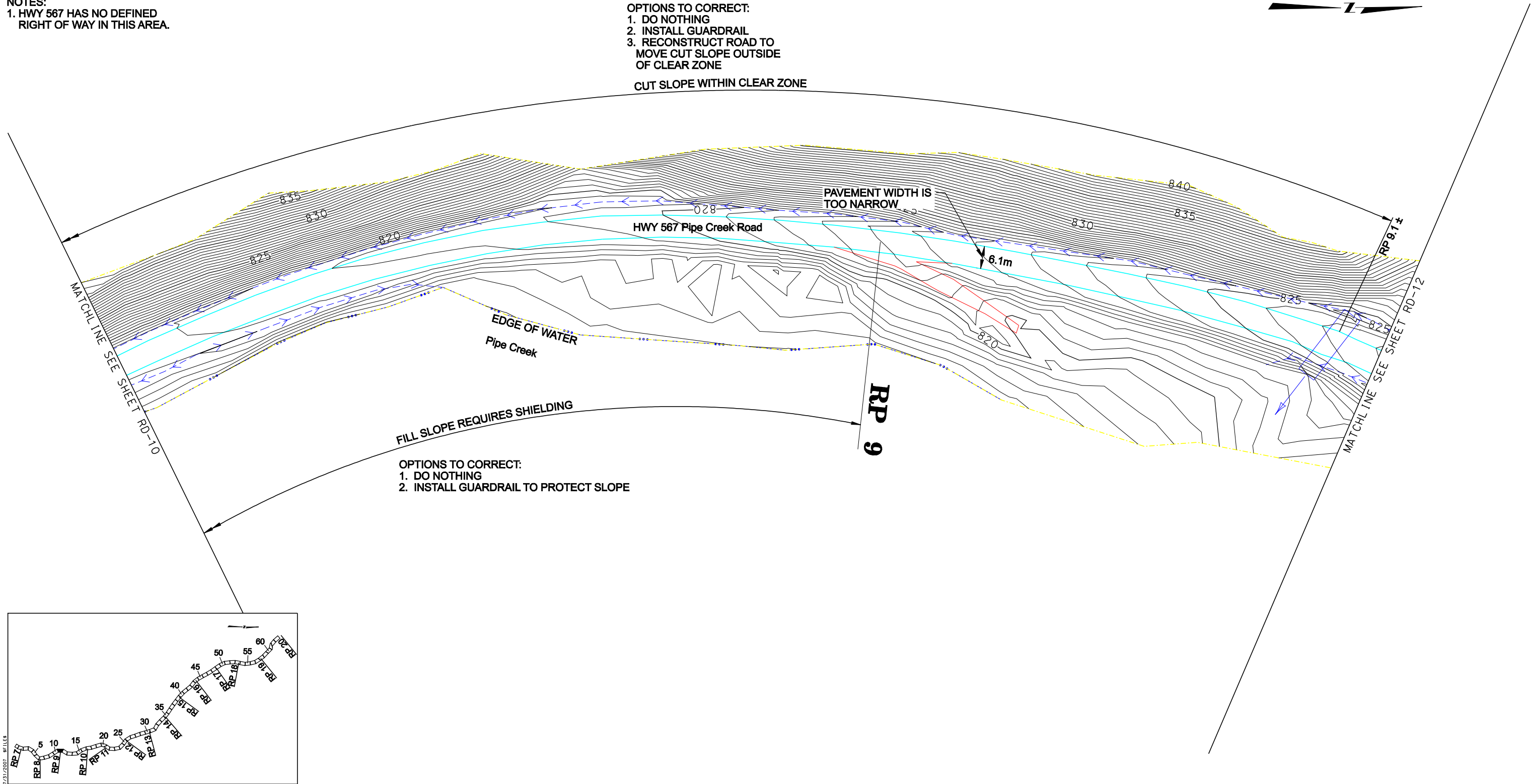


Scale in Meters
0 5 10 20

LEGEND
Edge of Pavement
Major Contours
Minor Contours
Creek or Ditch
Existing Guard Rail
Power Pole
Mail Box
Existing Right of Way
Property Line
Section Line
1/4 Section Line
Property Corner Found
Fire Hydrant
High Water Mark
Snow Storage Problem Area
Well
CROSS CULVERT
W / FLOW DIRECTION

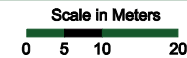
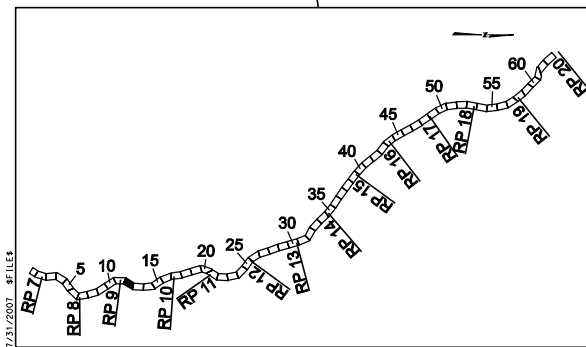
NOTES:
1. HWY 567 HAS NO DEFINED
RIGHT OF WAY IN THIS AREA.

OPTIONS TO CORRECT:
1. DO NOTHING
2. INSTALL GUARDRAIL
3. RECONSTRUCT ROAD TO
MOVE CUT SLOPE OUTSIDE
OF CLEAR ZONE
CUT SLOPE WITHIN CLEAR ZONE



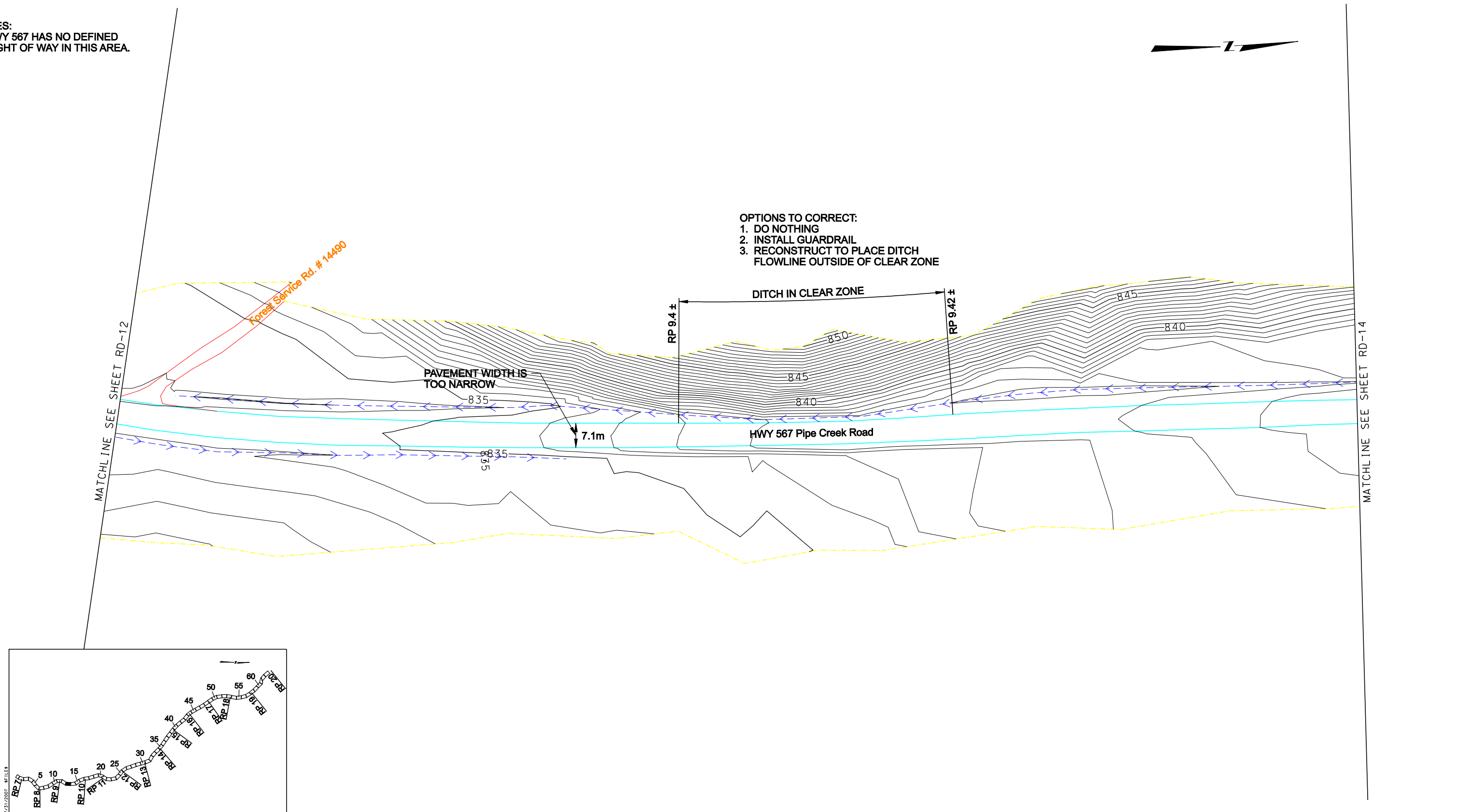
NOTES:

1. HWY 567 HAS NO DEFINED
RIGHT OF WAY IN THIS AREA.

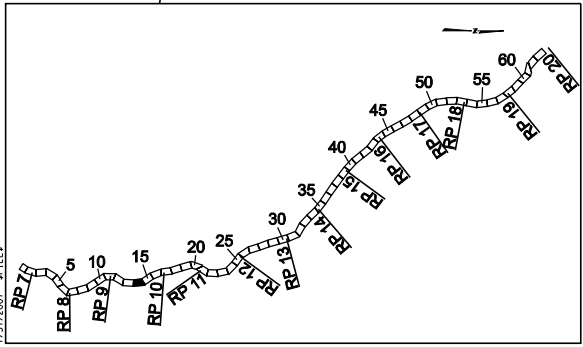
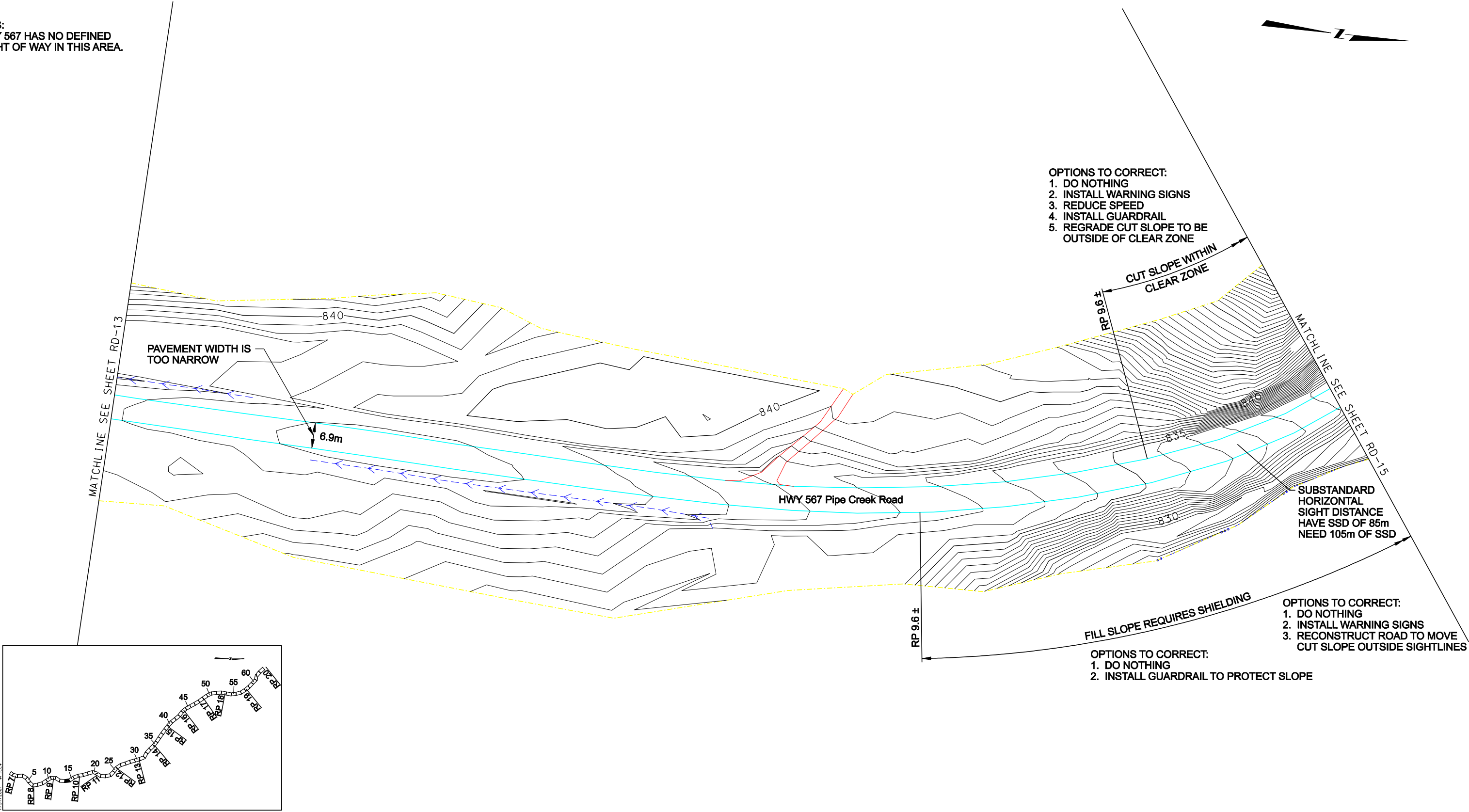


LEGEND									
Edge of Pavement	Creek or Ditch	Mail Box	Section Line	Fire Hydrant	Well	CROSS CULVERT W / FLOW DIRECTION			
Major Contours	Existing Guard Rail	Existing Right of Way	1/4 Section Line	High Water Mark					
Minor Contours	Power Pole	Property Line	Property Corner Found	Snow Storage Problem Area					

NOTES:
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RIGHT OF WAY IN THIS AREA.



NOTES:
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RIGHT OF WAY IN THIS AREA.



NOTES:
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RIGHT OF WAY IN THIS AREA.

OPTIONS TO CORRECT:

1. DO NOTHING
2. INSTALL WARNING SIGNS
3. REDUCE SPEED
4. INSTALL GUARDRAIL
5. REGRADE CUT SLOPE TO BE OUTSIDE OF CLEAR ZONE

CUT SLOPE WITHIN
CLEAR ZONE

RP 9.7 ±

MATCHLINE SEE SHEET RD-14

VPI OF A 90m SAG VERTICAL CURVE
SSD = 65m
SSD SHOULD BE = 105m

HWY 567 Pipe Creek Road

PAVEMENT WIDTH IS
TOO NARROW

6.2m

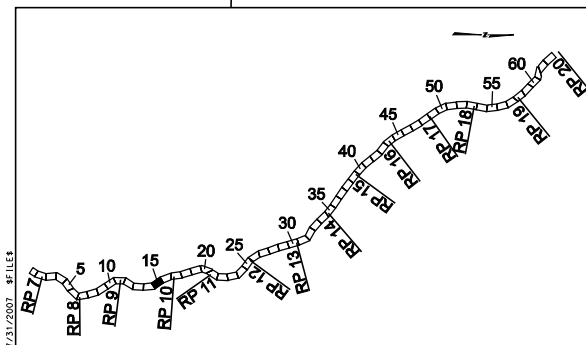
MATCHLINE SEE SHEET RD-16

FILL SLOPE REQUIRES SHIELDING

RP 9.8 ±

OPTIONS TO CORRECT:

1. DO NOTHING
2. INSTALL GUARDRAIL TO PROTECT SLOPES



Scale in Meters

0 5 10 20

LEGEND

- | | | | | | |
|------------------|---------------------|-----------------------|-----------------------|---------------------------|--------------------|
| Edge of Pavement | Creek or Ditch | Mail Box | Section Line | Fire Hydrant | Well |
| Major Contours | Existing Guard Rail | Existing Right of Way | 1/4 Section Line | High Water Mark | CROSS CULVERT |
| Minor Contours | Power Pole | Property Line | Property Corner Found | Snow Storage Problem Area | W / FLOW DIRECTION |

NOTES:
1. HWY 567 HAS NO DEFINED
RIGHT OF WAY IN THIS AREA.

OPTIONS TO CORRECT:
1. DO NOTHING
2. INSTALL WARNING SIGNS
3. INSTALL GUARDRAIL
4. REGRADE CUT SLOPE TO BE
OUTSIDE OF CLEAR ZONE

CUT SLOPE INSIDE CLEAR ZONE

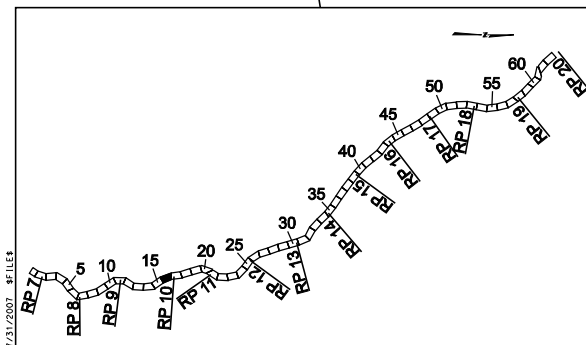
PAVEMENT WIDTH IS
TOO NARROW

6.7m

FILL SLOPE REQUIRES SHIELDING

OPTIONS TO CORRECT:
1. DO NOTHING
2. INSTALL GUARDRAIL TO PROTECT SLOPES

EDGE OF WATER
Pipe Creek



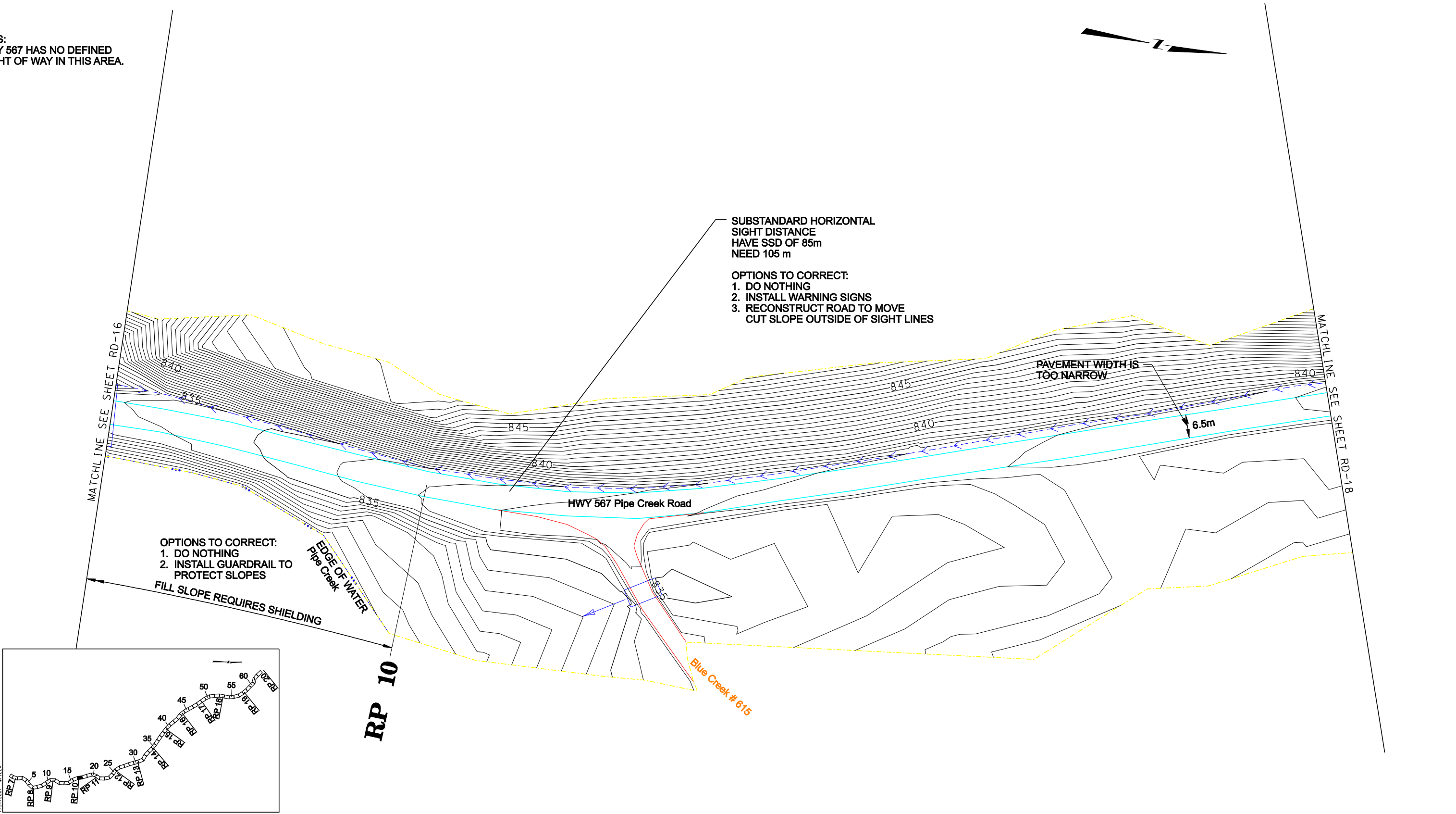
Scale in Meters

0 5 10 20

LEGEND

Edge of Pavement	Creek or Ditch	Mail Box	Section Line	Fire Hydrant	Well
Major Contours	Existing Guard Rail	Existing Right of Way	1/4 Section Line	High Water Mark	CROSS CULVERT
Minor Contours	Power Pole	Property Line	Property Corner Found	Snow Storage Problem Area	W / FLOW DIRECTION

NOTES:
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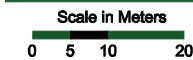
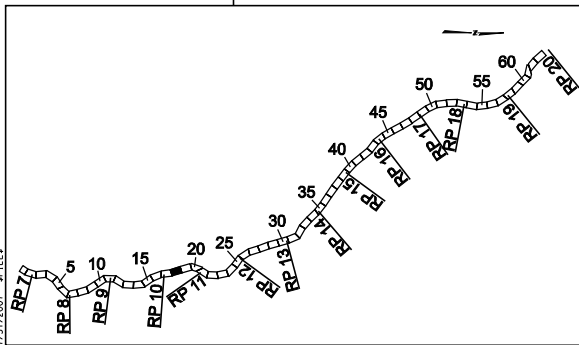
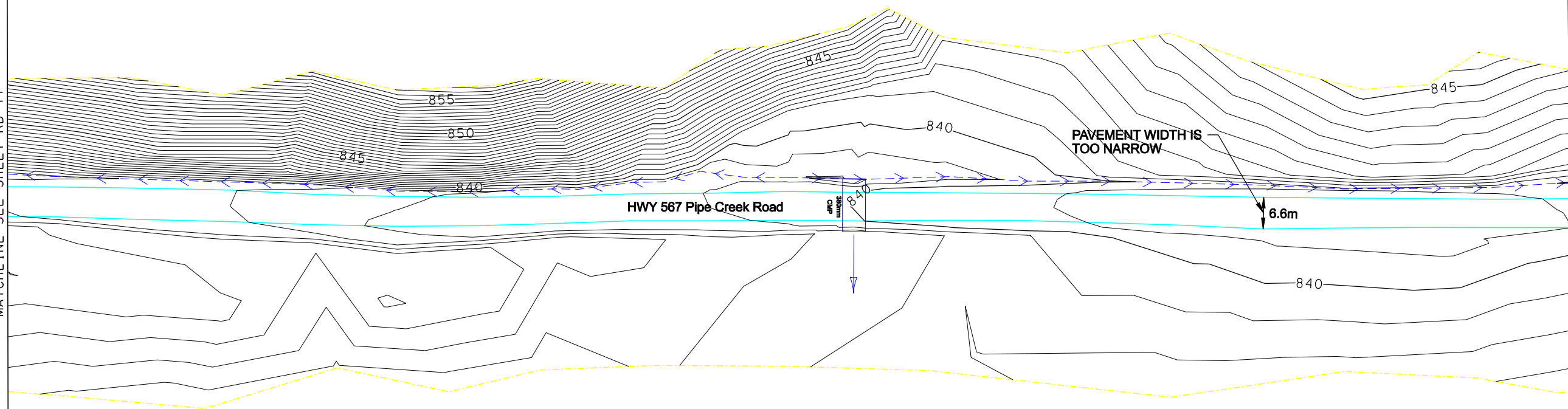


NOTES:
1. HWY 567 HAS NO DEFINED
RIGHT OF WAY IN THIS AREA.



MATCHLINE SEE SHEET RD-17

MATCHLINE SEE SHEET RD-19



Edge of Pavement	Creek or Ditch	Mail Box	Section Line	Fire Hydrant	Well
Major Contours	Existing Guard Rail	Existing Right of Way	1/4 Section Line	High Water Mark	CROSS CULVERT
Minor Contours	Power Pole	Property Line	Property Corner Found	Snow Storage Problem Area	W / FLOW DIRECTION